



## **/ Project documentation**

# **2023-03-18\_h30\_abcdg**

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**Project number:** ---  
**Location:** Germany / Lörrach  
**Date:** 3/18/2023

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**Location:** Germany / Lörrach  
**Grid voltage:** 230V (230V / 400V)

#### System overview

**14 x Tidesolar Technology Co. Ltd. TD-410MC-108HC (08/2022) (PV array 1)**

Azimuth angle: -57 °, Tilt angle: 45 °, Mounting type: Roof, Peak power: 5.74 kWp



**1 x SMA STP6.0-3AV-40**

#### PV design data

Total number of PV modules:	<b>14</b>	Spec. energy yield*:	<b>973 kWh/kWp</b>
Peak power:	<b>5.74 kWp</b>	Line losses (in % of PV energy):	---
Number of PV inverters:	<b>1</b>	Unbalanced load:	<b>0.00 VA</b>
Nominal AC power of the PV inverters:	<b>6.00 kW</b>	Annual energy consumption:	<b>3,600 kWh</b>
AC active power:	<b>5.70 kW</b>	Self-consumption:	<b>1,139 kWh</b>
Active power ratio:	<b>99.3 %</b>	Self-consumption quota:	<b>20.4 %</b>
Annual energy yield*:	<b>5,582 kWh</b>	Self-sufficiency quota:	<b>31.6 %</b>
Energy usability factor:	<b>99.8 %</b>	CO <sub>2</sub> reduction after 20 years:	<b>37 t</b>
Performance ratio*:	<b>86 %</b>		

\*Important: The yield values displayed are estimates. They are determined mathematically. SMA Solar Technology AG accepts no responsibility for the real yield value which can deviate from the yield values displayed here. Reasons for deviations are various external conditions, such as soiling of the PV modules or fluctuations in the efficiency of the PV modules.

# Your energy system at a glance

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## / Energy system

### PV system

#### PV inverter

1 x SMA STP6.0-3AV-40

#### PV arrays

14 x Tidesolar Technology Co. Ltd.  
TD-410MC-108HC

### Additional components

#### Energy management

1 x Sunny Portal

### System size

#### PV system

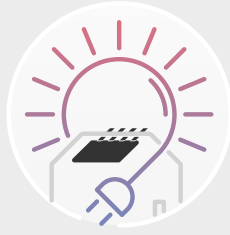
5.74 kWp

## / Benefits



**444 EUR**

Feed-in tariff in the first  
year



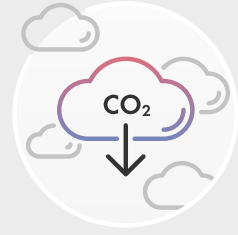
**31.6 %**

Self-sufficiency quota



**27 EUR**

Electricity costs saved per  
month



**37 t**

CO<sub>2</sub> reduction after 20  
years

**Total savings after 20 year(s): 16,875 EUR**

# Inverter designs

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**Ambient temperature:**

Annual extreme low temperature: -10 °C

Average high Temperature: 20 °C

Annual extreme high temperature: 33 °C

## / Subproject Subproject 1

### 1 x SMA STP6.0-3AV-40 (PV system section 1)

Peak power:	5.74 kWp
Total number of PV modules:	14
Number of PV inverters:	1
Max. DC power ( $\cos \varphi = 1$ ):	6.22 kW
Max. AC active power ( $\cos \varphi = -0.95$ ):	5.70 kW
Grid voltage:	230V (230V / 400V)
Nominal power ratio:	103 %
Dimensioning factor:	100.7 %
Displacement power factor $\cos \varphi$ :	-0.95
Full load hours:	930.4 h



### PV design data

#### Input A: PV array 1

14 x Tidesolar Technology Co. Ltd. TD-410MC-108HC (08/2022), Azimuth angle: -57 °, Tilt angle: 45 °, Mounting type: Roof

	Input A:	Input B:
Number of strings:	1	
PV modules:	14	
Peak power (input):	5.74 kWp	---
Inverter min. DC voltage (Grid voltage 230 V):	125 V	125 V
PV typical voltage:	✓ 410 V	---
Min. PV voltage:	383 V	---
Max. DC voltage (Inverter):	850 V	850 V
Max. PV voltage	✓ 575 V	---
Inverter max. operating input current per MPPT:	12 A	12 A
Max. MPP current of PV array:	i 13.2 A	---
Inverter max. input short-circuit current per MPPT:	18 A	18 A
PV max. circuit current	✓ 13.9 A	---

### PV/Inverter compatible

You get this inverter including SMA ShadeFix. SMA ShadeFix is a patented inverter software that automatically optimizes the yield of PV systems in any situation. Even under shading conditions.

# Information

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## ✓ 2023-03-18\_h30\_abcdg

- i PV systems with an installed power of a maximum 25 kWp must, according to the Renewable Energy Sources Act (EEG) 2021, be equipped with technical equipment with which the grid operator can remotely reduce the feed-in capacity in the event of grid overload at all times. Alternatively, the maximum active power feed-in of the PV system at the point of interconnection can be limited to 70% of the installed power.
- i In Germany, energy generation plants with a power of between 3.68 kVA and 13.8 kVA must be able to make reactive power available in accordance with requirements of the grid operator as of January 1, 2012. The displacement power factor of the inverters used will automatically be adjusted to 0.95 under-excited (-).

## ✓ Subproject 1

### ✓ 1 x SMA STP6.0-3AV-40 (PV system section 1)

- i You get this inverter including SMA ShadeFix. SMA ShadeFix is a patented inverter software that automatically optimizes the yield of PV systems in any situation. Even under shading conditions.

# Self-consumption (electricity)

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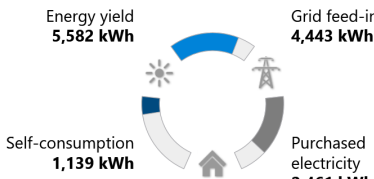
## / Result

### Information on self-consumption

Load profile:	<b>2 adults, both in full-time employment</b> Private household with two people in full-time employment.
Annual energy consumption:	<b>3,600 kWh</b>

### Increased self-consumption

### Without increased self-consumption

Self-sufficiency quota	Distribution of PV energy	Details
<div><div>31.6 %</div></div>		Annual energy consumption3,600 kWh
Self-consumption quota		Annual energy yield5,582 kWh
<div><div>20.4 %</div></div>		Grid feed-in4,443 kWh
		Purchased electricity2,461 kWh
		Max. purchased electricity power7.15 kW
		Self-consumption1,139 kWh
		Self-consumption quota (in % of PV energy)20.4 %
		Self-sufficiency quota (energy consumption in %)31.6 %

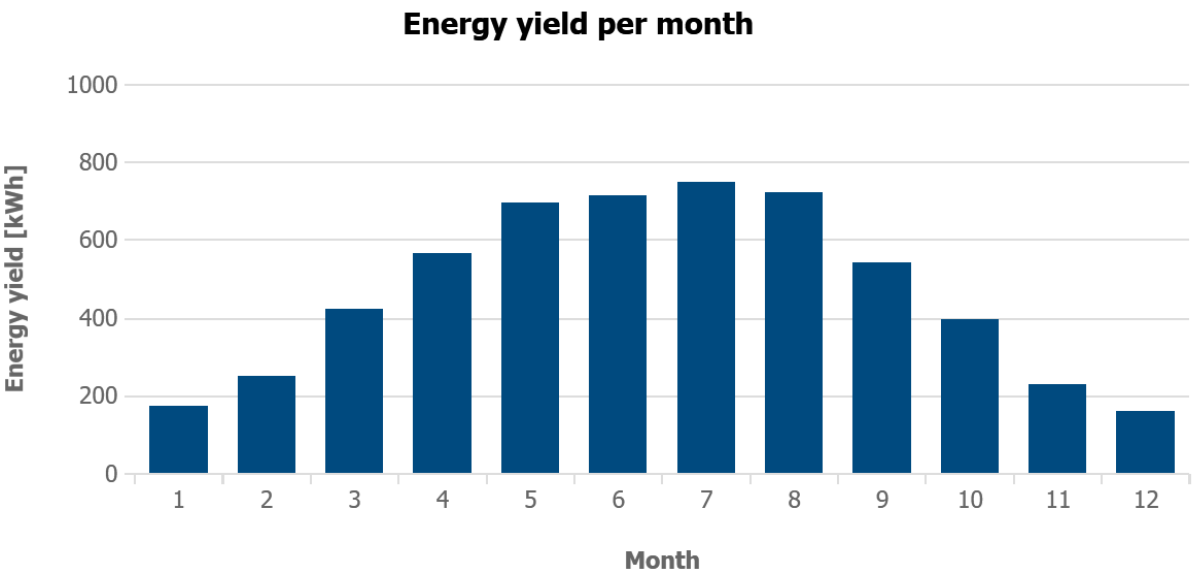


# Monthly values

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## / Energy yield



Month	Energy yield [kWh]	Self-consumption [kWh]	Grid feed-in [kWh]	Purchased electricity [kWh]
1	170 (3.0 %)	54	115	274
2	249 (4.5 %)	69	179	238
3	420 (7.5 %)	97	323	224
4	563 (10.1 %)	118	445	178
5	692 (12.4 %)	142	550	172
6	711 (12.7 %)	129	582	157
7	746 (13.4 %)	132	613	165
8	717 (12.8 %)	86	631	101
9	539 (9.7 %)	103	437	181
10	392 (7.0 %)	86	306	237
11	227 (4.1 %)	63	165	257
12	157 (2.8 %)	61	97	278



# Project images

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ne roof a plus b